We claim:

1. A digital storage medium, comprising:

a substrate;

a first magnetic layer disposed over the substrate, wherein the first magnetic layer has a first magnetic moment having a tilted easy axis;

a second magnetic layer disposed over the first magnetic layer, wherein the second magnetic layer has a second magnetic moment having a tilted easy axis; and

an overcoat layer disposed over the second magnetic layer.

2. The digital storage medium of claim 1, wherein the tilted easy axes form acute angles with a perpendicular plane of the digital storage medium.

3. The digital storage medium of claim 2, wherein the acute angles are of different magnitudes.

4. The digital storage medium of claim 2, wherein the acute angles are of the same magnitude.

5. The digital storage medium of claim 2, wherein the tilted easy axes are bi-axial.

6. The digital storage medium of claim 1, wherein an exchange coupling occurs between the first and second magnetic layers.

7. The digital storage medium of claim 1, wherein the first magnetic layer has a perpendicular magnetic anisotropy and the second magnetic layer has a longitudinal anisotropy.

8. The digital storage medium of claim 1, wherein the first magnetic layer has a longitudinal magnetic anisotropy and the second magnetic layer has a perpendicular anisotropy.

9. The digital storage medium of claim 7 or 8, wherein the magnetic layer with the longitudinal anisotropy includes a material selected from a group consisting of cobalt (Co), iron (Fe), nickel (Ni), and alloys thereof.

10. The digital storage medium of claim 7, wherein the magnetic layer with the perpendicular anisotropy includes a material selected from a group consisting of cobalt, iron, and alloys thereof.

11. The digital storage medium of claim 8, wherein the magnetic layer with the perpendicular anisotropy includes a material selected from a group consisting of cobalt, iron, and alloys thereof.

12. The digital storage medium of claim 10, wherein the magnetic layer is formed from a single layer of alloys selected from a group consisting of cobalt-platinum (CoPt), cobalt-palladium (CoPd), cobalt-chromium-platinum (CoCrPt), cobalt-chromium-platinum-boron (CoCrPtB), cobalt-chromium-platinum-tantalum (CoCrPtTa), cobalt-chromium-platinum-niobium (CoCrPtNb), and iron-platinum (FePt).

13. The digital storage medium of claim 11, wherein the magnetic layer is formed from a single layer of alloys selected from a group consisting of cobalt-platinum (CoPt), cobalt-palladium (CoPd), cobalt-chromium-platinum (CoCrPt), cobalt-chromium-platinum-boron (CoCrPtB), cobalt-chromium-platinum-tantalum (CoCrPtTa), cobalt-chromium-platinum-niobium (CoCrPtNb), and iron-platinum (FePt).

14. The digital storage medium of claim 10, wherein the magnetic layer is formed from multiple layers of ferromagnetic materials selected from a group consisting of cobalt with palladium as a spacer layer (Co/Pd), cobalt with platinum as a spacer layer (Co/Pt), a cobalt alloy with palladium as a spacer layer, and a cobalt alloy with platinum as a spacer layer.

15. The digital storage medium of claim 11, wherein the magnetic layer is formed from multiple layers of ferromagnetic material selected from a group consisting of cobalt with palladium as a spacer layer (Co/Pd), cobalt with platinum as a spacer layer (Co/Pt), a cobalt alloy with palladium as a spacer layer, and a cobalt alloy with platinum as a spacer layer.

16. The digital storage medium of claim 12, wherein the alloys are doped with non-ferromagnetic materials selected from a group consisting of silicon oxide and silicon nitride.

17. The digital storage medium of claim 13, wherein the alloys are doped with non-ferromagnetic materials selected from a group consisting of silicon oxide and silicon nitride.

18. The digital storage medium of claim 1, further comprising an interlayer disposed between the first magnetic layer and the second magnetic layer.

19. The digital storage medium of claim 18, wherein the interlayer includes a high saturation magnetization material selected from a group consisting of cobalt, nickel, iron, alloys of cobalt, alloys of nickel, and alloys of iron.

20. The digital storage medium of claim 18, wherein the interlayer includes a non-magnetic material selected from a group consisting of ruthenium (Ru), rhodium (Rh), chromium (Cr), copper (Cu), iridium (Ir), and alloys thereof.

21. The digital storage medium of claim 2, wherein data is transmitted through a transducer, and wherein the transducer is selected from a group consisting of a ring head, a single pole head, and a head which applies a magnetic field at an angle to the digital storage medium.

22. The digital storage medium of claim 1, wherein the magnetic moments with tilted easy axes of the first and second magnetic moments are anti-parallel.

23. The digital storage medium of claim 1, wherein the magnetic moments with tilted easy axis of the first and second magnetic moments are parallel.

24. A method of manufacturing a digital storage medium, the method comprising:

depositing a first magnetic layer on a substrate surface, wherein the first magnetic layer has a first magnetic moment with a first easy axis; and

depositing a second magnetic layer on the first magnetic layer, wherein the second magnetic layer has a second magnetic moment with a second easy axis;

wherein the second easy axis is perpendicular to the first easy axis; and

wherein exchange-coupling of the first magnetic moment and the second magnetic moment forms tilted easy axes in the first and second magnetic layers.

25. The method of claim 24, wherein the first magnetic layer has a perpendicular anisotropy and the second magnetic layer has a longitudinal anisotropy.

26. The method of claim 24, wherein the first magnetic layer has a longitudinal anisotropy and the second magnetic layer has a perpendicular anisotropy.

27. The method of claim 25, wherein the magnetic layer with the perpendicular anisotropy includes a ferromagnetic material selected from a group consisting of cobalt, iron, and alloys thereof.

28. The method of claim 26, wherein the magnetic layer with the perpendicular anisotropy includes a ferromagnetic material selected from a group consisting of cobalt, iron, and alloys thereof.

29. The method of claim 27, wherein the magnetic layer is formed from a single layer of at least one alloy selected from a group consisting of cobalt-platinum (CoPt), cobalt-palladium (CoPd), cobalt-chromium-platinum (CoCrPt), cobalt-chromium-platinum-boron (CoCrPtB), cobalt-chromium-platinum-tantalum (CoCrPtTa), cobalt-chromium-platinum-niobium (CoCrPtNb), and iron-platinum (FePt).

30. The method of claim 28, wherein the magnetic layer is formed from a single layer of at least one alloy selected from a group consisting of cobalt-platinum (CoPt), cobalt-palladium (CoPd), cobalt-chromium-platinum (CoCrPt), cobalt-chromium-platinum-boron (CoCrPtB), cobalt-chromium-platinum-tantalum (CoCrPtTa), cobalt-chromium-platinum-niobium (CoCrPtNb), and iron-platinum (FePt).

31. The method of claim 27, wherein the magnetic layer is formed from multiple layers of ferromagnetic materials selected from a group consisting of cobalt with palladium as a spacer layer (Co/Pd), cobalt with platinum as a spacer layer (Co/Pt), a cobalt alloy with palladium as a spacer layer, and a cobalt alloy with platinum as a spacer layer.

32. The method of claim 28, wherein the magnetic layer is formed from multiple layers of ferromagnetic materials selected from a group consisting of cobalt with palladium as a spacer layer (Co/Pd), cobalt with platinum as a spacer layer (Co/Pt), a cobalt alloy with palladium as a spacer layer, and a cobalt alloy with platinum as spacer layer.

33. The method of claim 29, wherein the alloys are doped with non-ferromagnetic materials selected from a group consisting of silicon oxide and silicon nitride.

34. The method of claim 30, wherein the alloys are doped with non-ferromagnetic materials selected from a group consisting of silicon oxide and silicon nitride.

35. The method of claim 24, wherein the first magnetic layer and the second magnetic layer each have a thickness that is variable.

36. The method of claim 24, wherein an angle is formed between the tilted easy axes and a perpendicular plane of the digital storage medium.

37. The method of claim 36, wherein the angle is adjustable by varying the type of ferromagnetic materials in the first and second magnetic layers.

38. The method of claim 36, wherein the angle is adjustable by varying an exchange-coupling constant between the first and second magnetic layer.

39. The method of claim 36, wherein the angle is adjustable by varying the thickness of the first and second magnetic layers.

40. The method of claim 24, wherein an interlayer is disposed between the first and second magnetic layers.